



COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

WJS/R

DIVISION OF FOOD PRESERVATION AND TRANSPORT

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*The laboratory is situated in the grounds
of the State Abattoir, Homebush Bay.*AIRMAILPRIVATE BAG. POST OFFICE,
HOMEBUSH. N.S.W.

30th July, 1959

Professor J. Lederberg,
Genetics Department,
Stanford University,
STANFORD, CALIF. U.S.A.

Dear Josh:

Thank you for your mimeographed note about the preservation of cultures on silica gel. I had not seen this before although I remember you telling me about it. The performance will of course depend on the humidity within the sealed tube, and this can be fairly well controlled by attending to the relative amounts of silica gel and water added. In the presence of air the control of humidity is more critical than in vacuo for organisms dried from water or broth, but not when certain substances such as sugars or polyols are present in fair concentration. For other reasons reducing sugars are to be avoided.

Regarding your query about possible lethal effects of very low pressures I think there can be no doubt that the escape of a sufficient number of molecules will produce the expected result. For essential constituents a finite vapour pressure at the relevant temperature will suffice if the organisms are exposed for a long time in a container without walls. I suppose that useful extrapolations can be made about vapour pressures at the pressures and temperatures likely to be concerned. So far as I know no one has made a serious study of the effects of very low pressures on bacteria. Apart from difficulties of obtaining very low pressures one might expect that meaningful experiments might require inconveniently large containers.

Separately I am sending you/a reprint of my paper on the effects of residual water (J.Gen. Microbiol. 19 : 624). A paper offering evidence in support of the hypothesis that death may result from reactions between carbonyl compounds and amino groups on important cellular constituents has not yet appeared, although Parkes has had the MS for 15 months. The reference is cited in the above paper. We have a paper on rehydration problems due to appear next month in J. Gen. Microbiol. and another paper dealing with death during drying has just been accepted by the same Journal. Results in the latter paper show that some simple hypotheses about drying conditions must be rejected. We have so far no useful clues regarding the factors which presumably are decisive in respect of the reversibility of the drying process. At present we are trying to look at some of the chemical events going on during dry storage.

Shall send you reprints as they come to hand. I shall, of course, be honoured to receive a copy of your recent discourse at Stockholm when you have some available.

Best wishes,

Yours sincerely,

Bill

(W.J. Scott)

Scott W.J.